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Bird et al.

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(54) **PROJECTILE FIRING BUILDING ELEMENT**

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F41B 15/00 (2006.01)

(52) **U.S. Cl.**
CPC .. ***F41B 15/00*** (2013.01); ***F41B 7/08*** (2013.01)
USPC **124/79**; 124/31; 446/102; 446/473

(58) **Field of Classification Search**
USPC 446/102, 473, 486, 63, 399, 401; 273/317, 405; 124/1, 31, 79; 473/578
See application file for complete search history.

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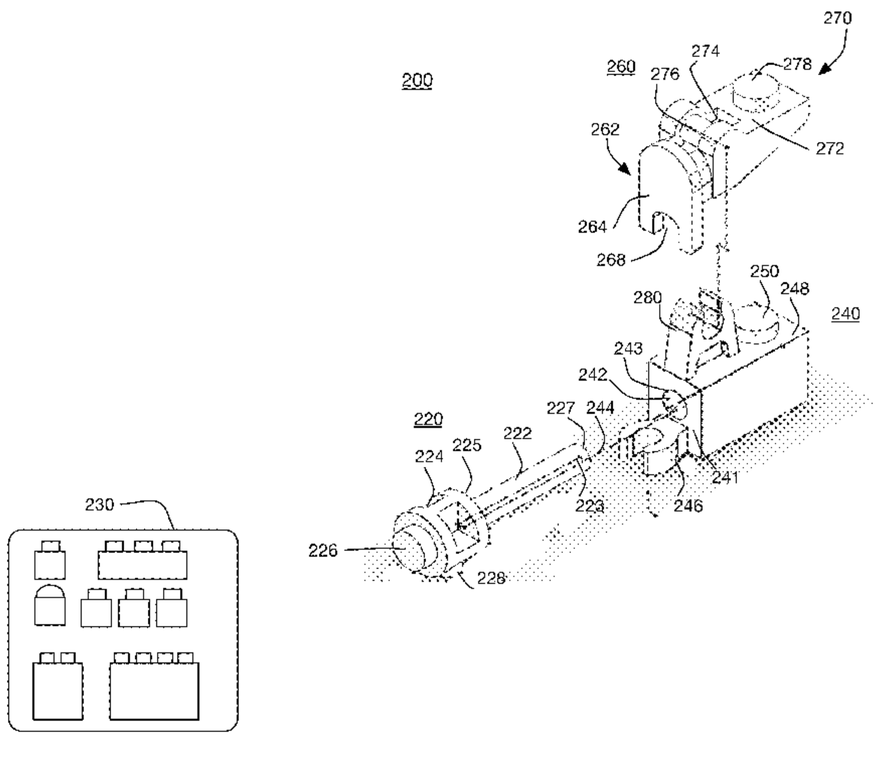
(57) **ABSTRACT**

A toy assembly includes a projectile that includes a linear portion and an engagement portion. The toy assembly also includes a base that includes a pivot point and defines an opening that receives the linear portion of the projectile, and the base retains the projectile in a frictional engagement. The assembly also includes an actuator that includes a trigger portion. The actuator is coupled to the base at the pivot point. Applying force to the trigger portion of the actuator in a first direction causes movement of the engagement portion of the projectile in a second direction, distinct from the first direction, and releases the projectile from the frictional engagement.

27 Claims, 11 Drawing Sheets



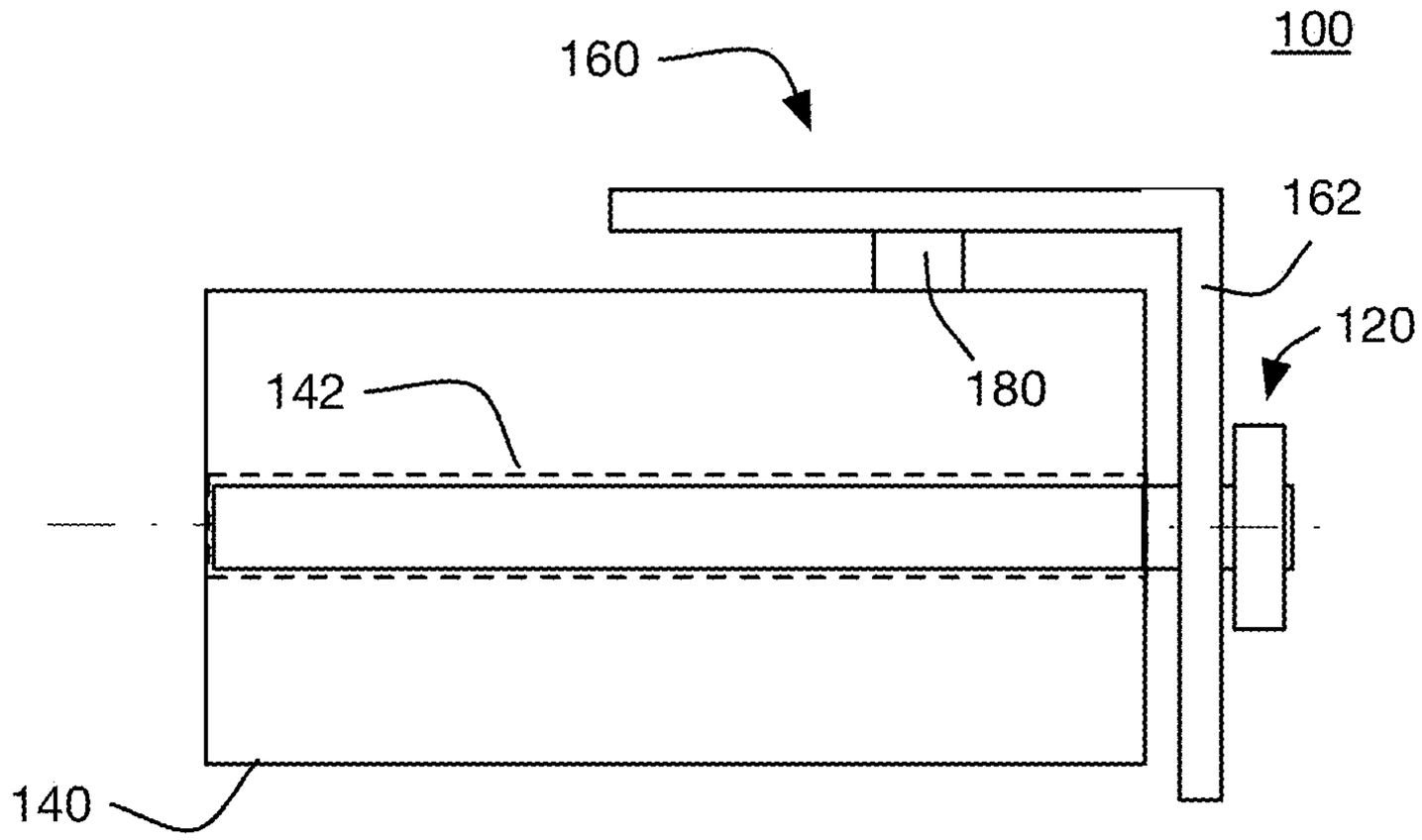
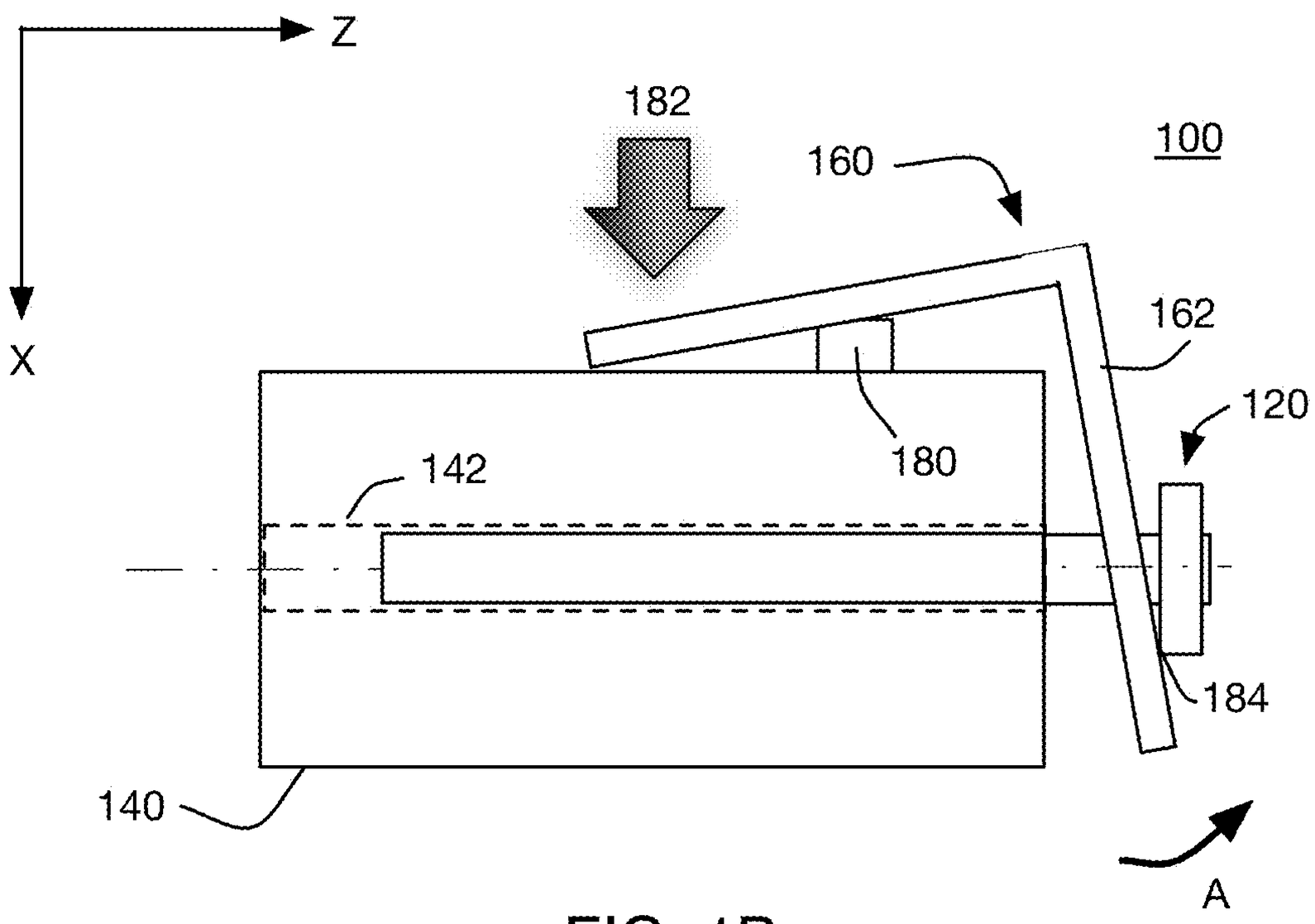

160
100
162
120
142
180
140

FIG. 1A


Z
X
182
160
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162
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140
184
A

FIG. 1B

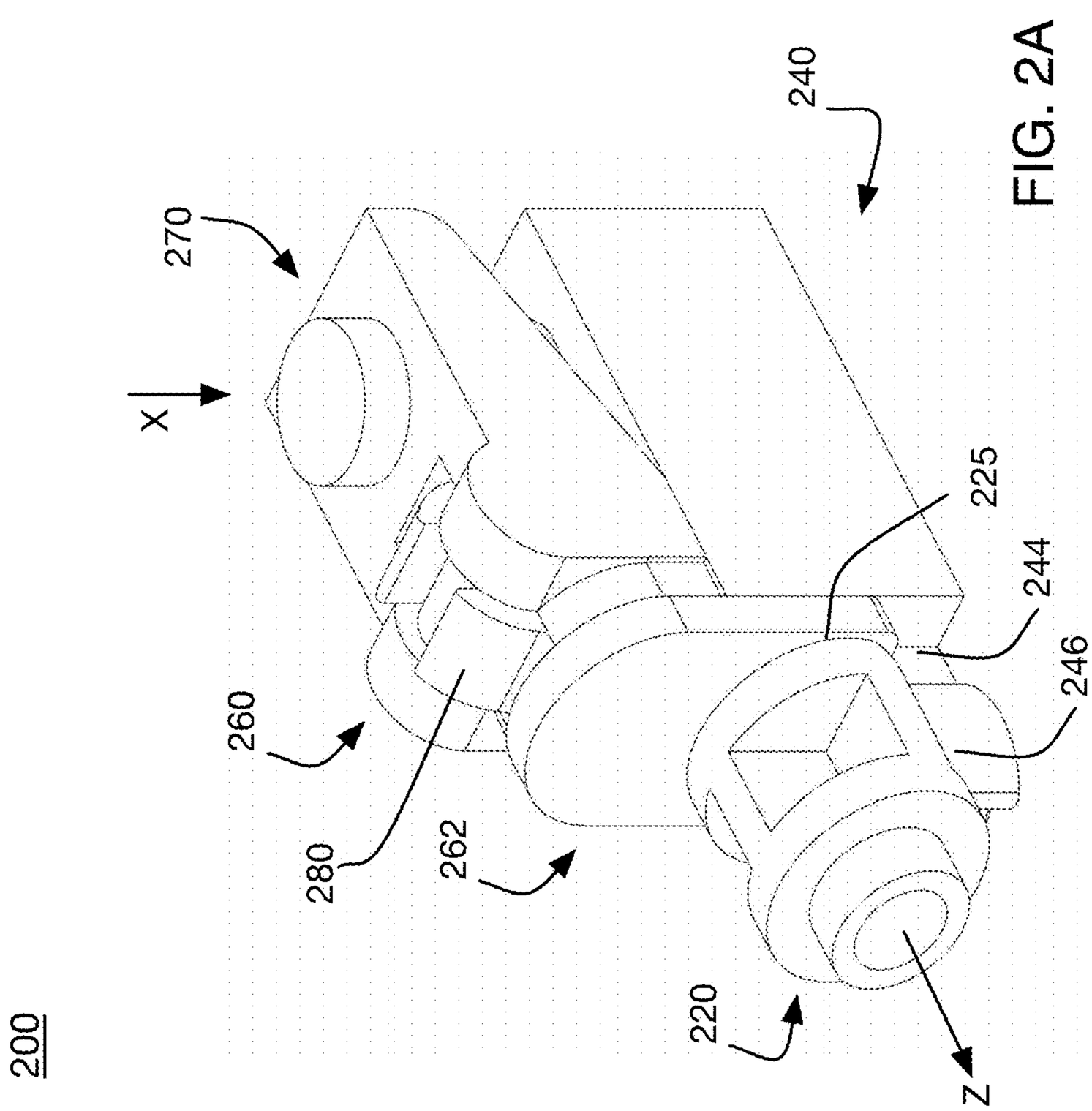
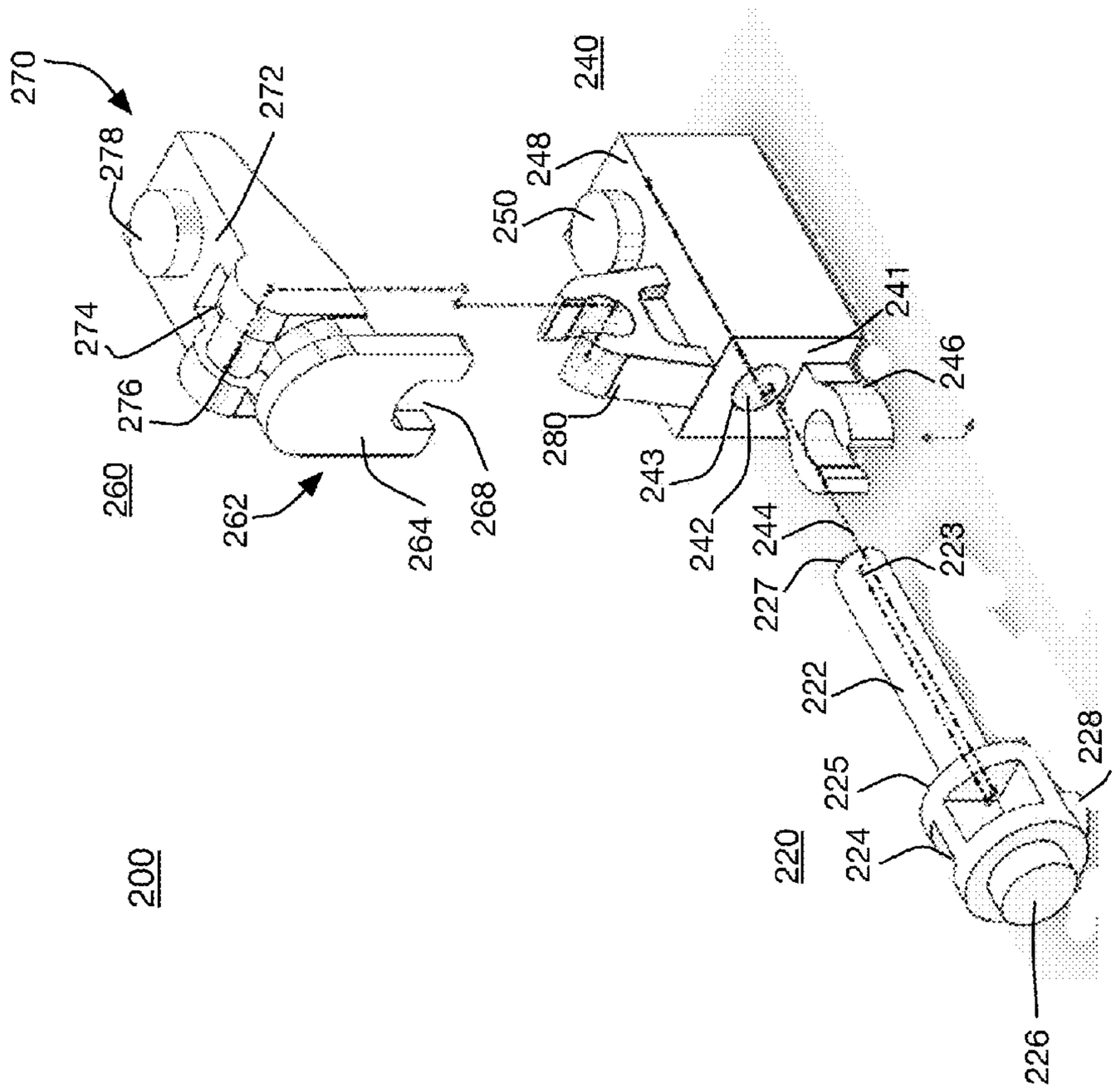


FIG. 2A


200
220
222
223
224
225
226
227
228
230
240
241
242
243
244
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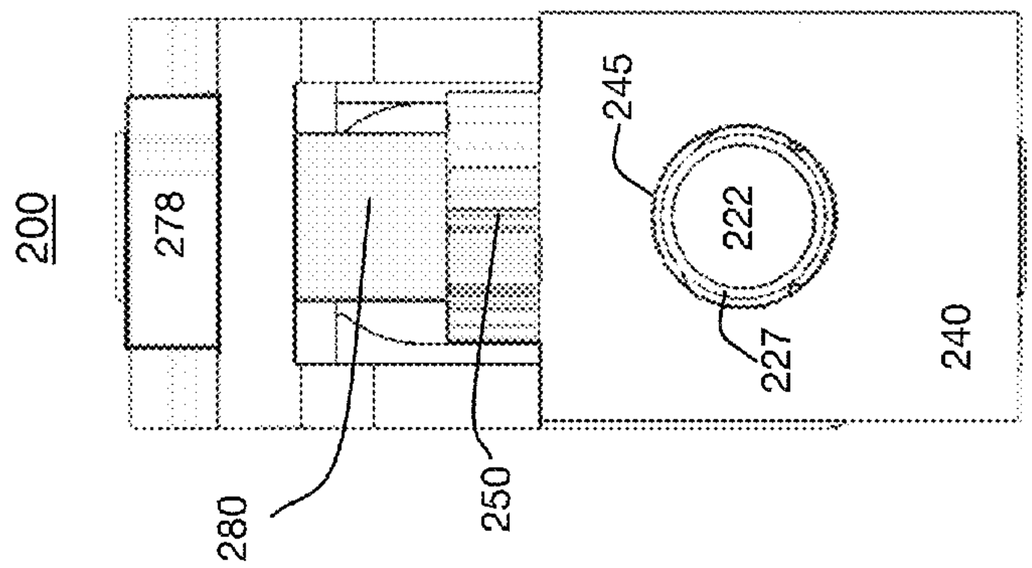
248
250
260
262
264
268
270
272
274
276
278
280

FIG. 2B



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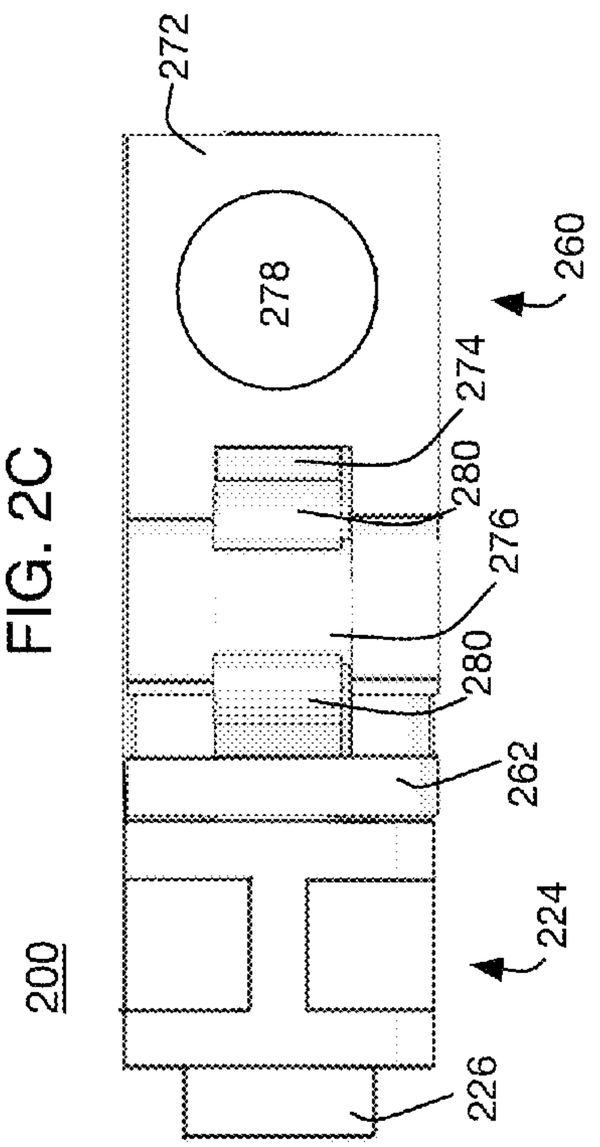


FIG. 2C

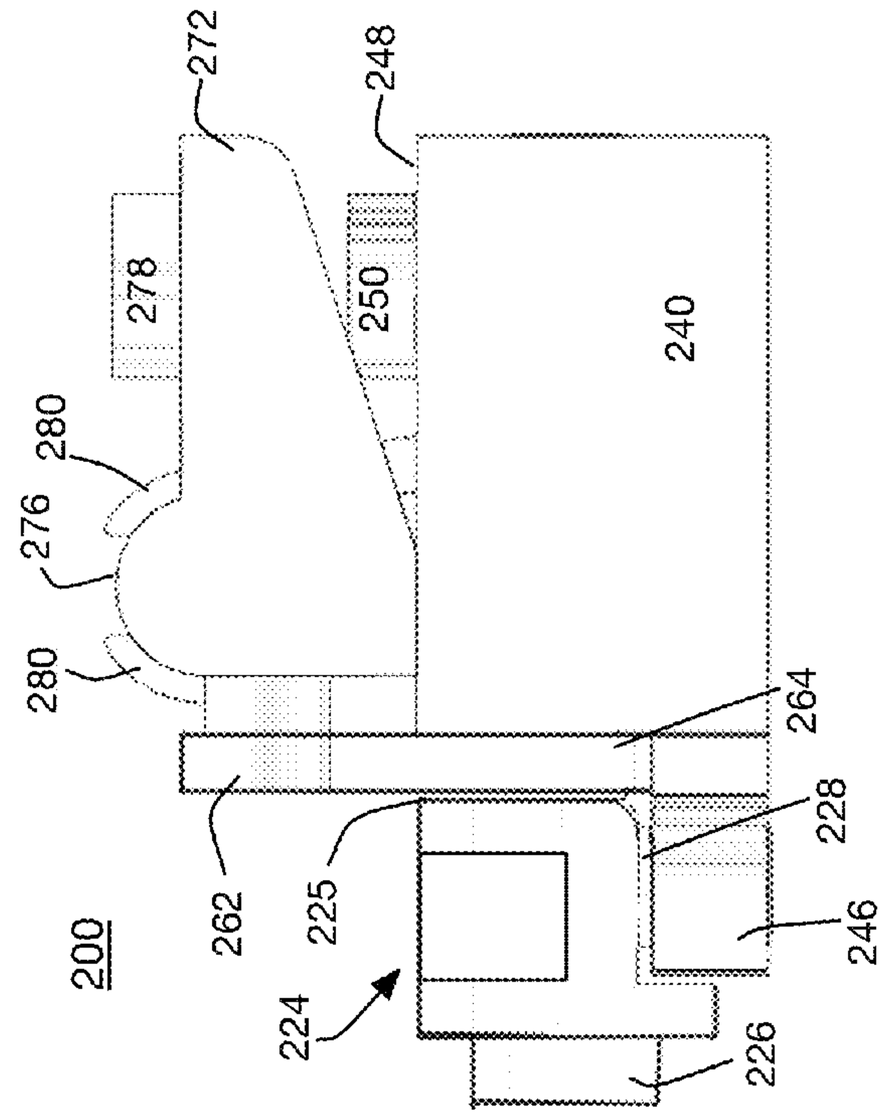


FIG. 2E

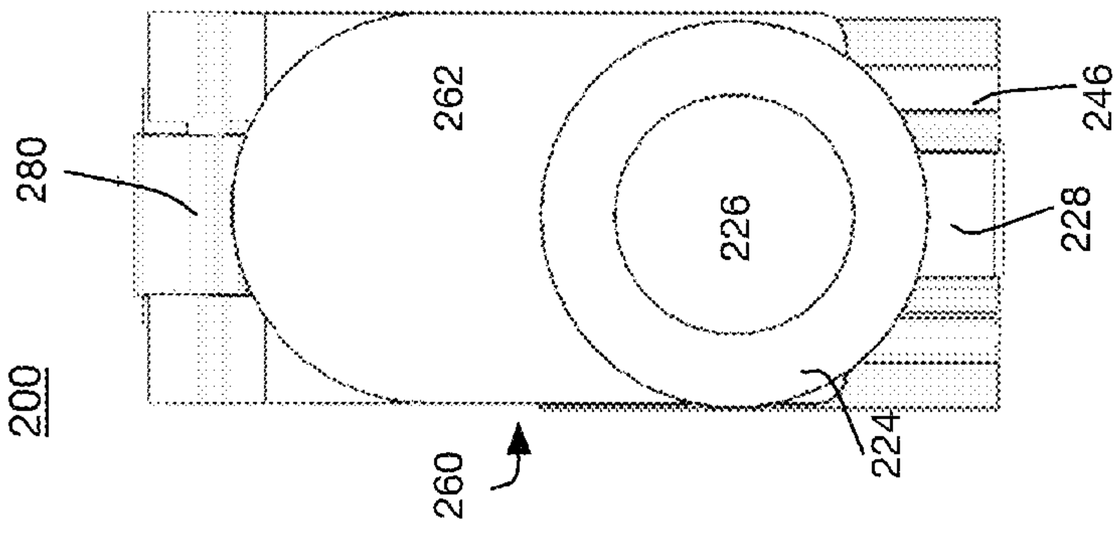


FIG. 2D

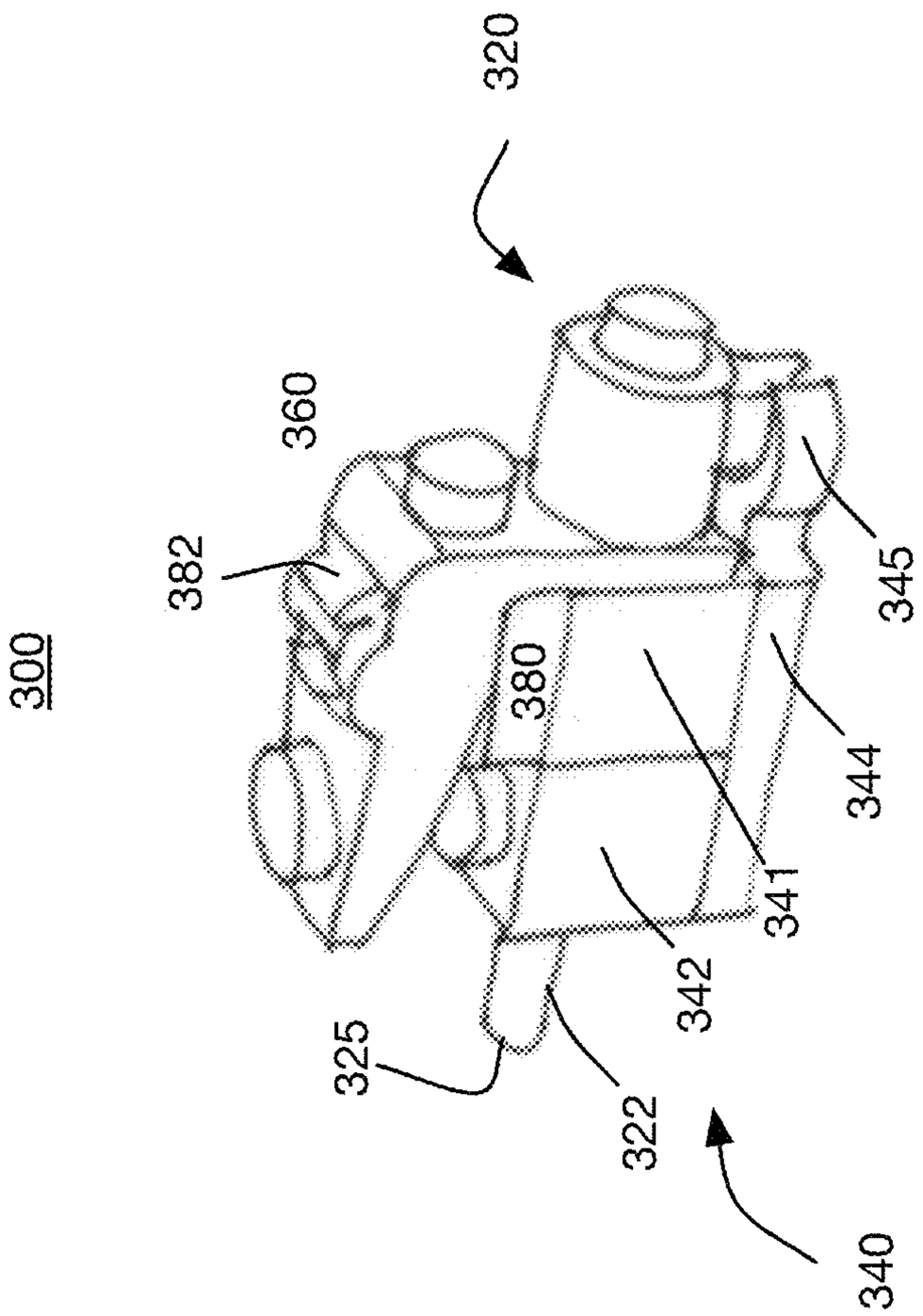


FIG. 3A

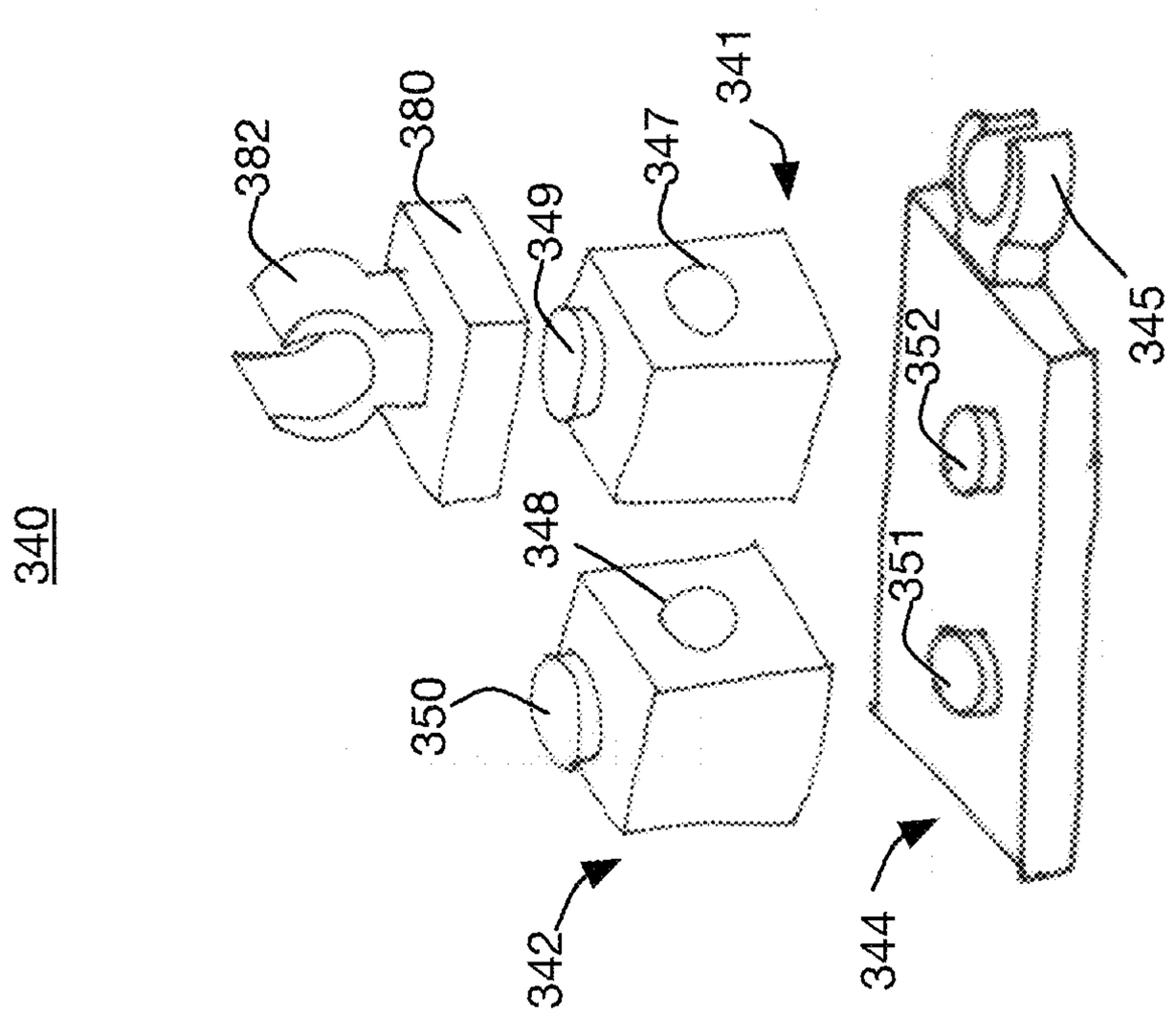


FIG. 3B

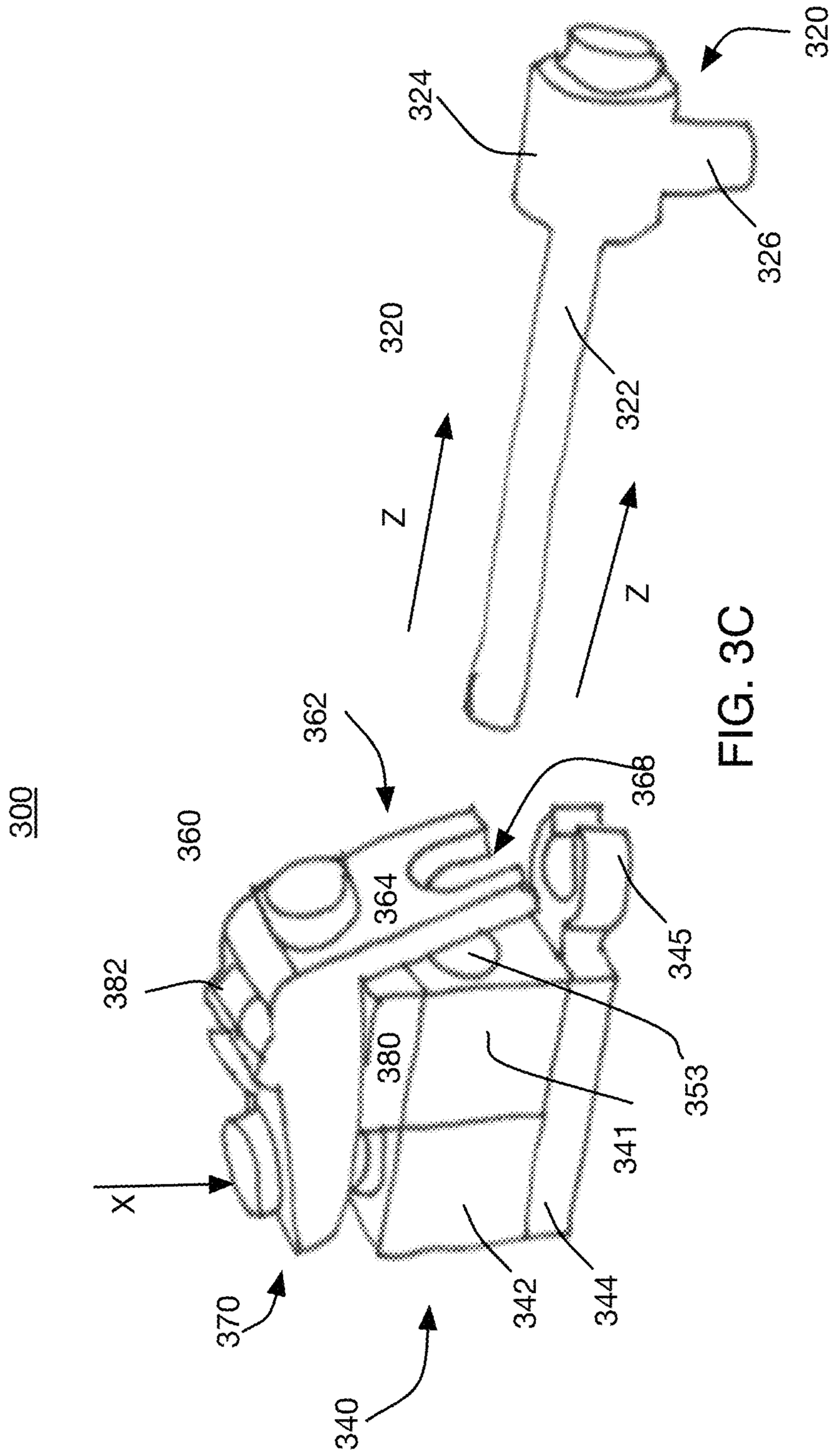
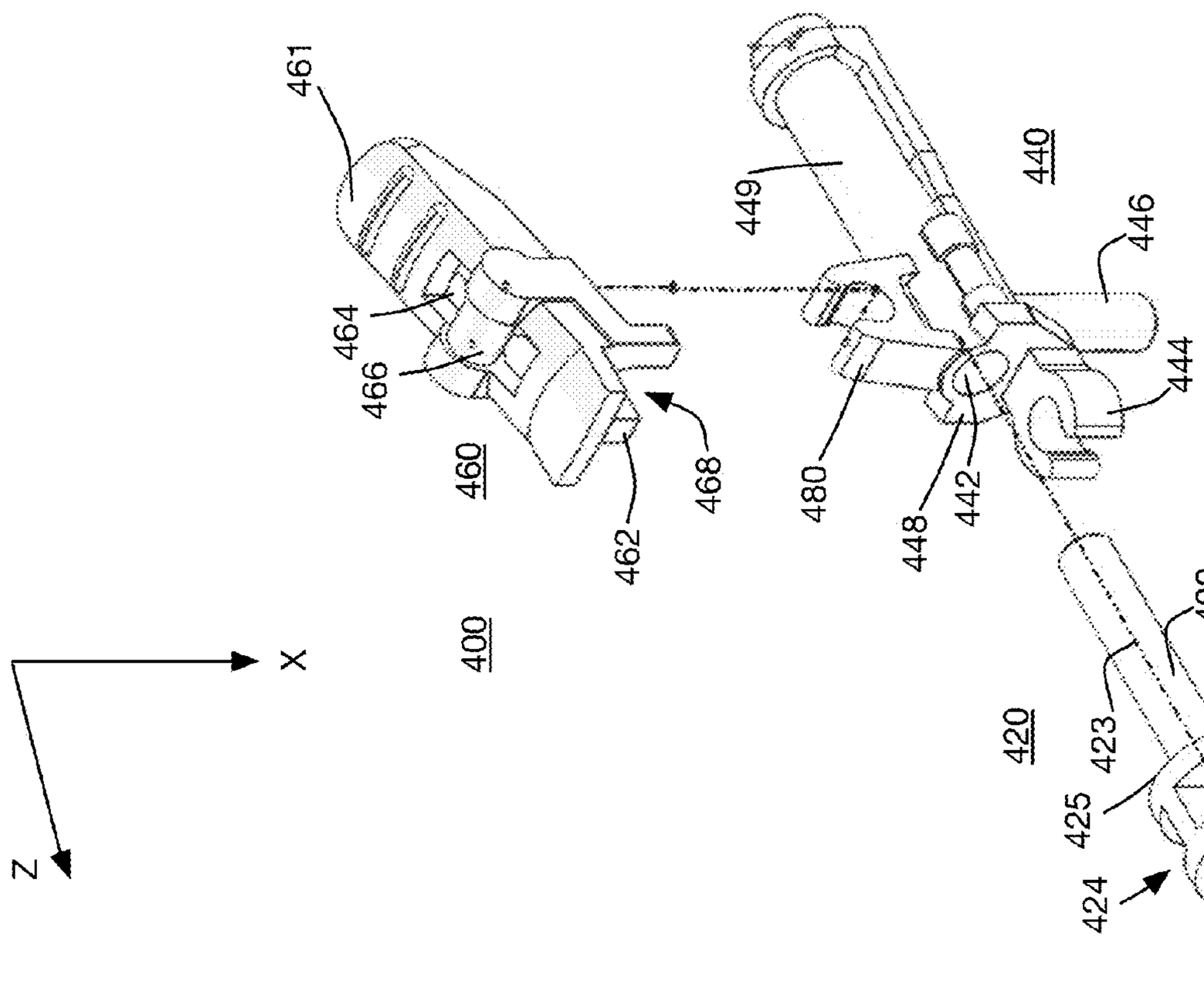

300
320
324
326
320
322
Z
Z
362
360
368
364
382
345
380
353
341
X
370
342
344
340

FIG. 3C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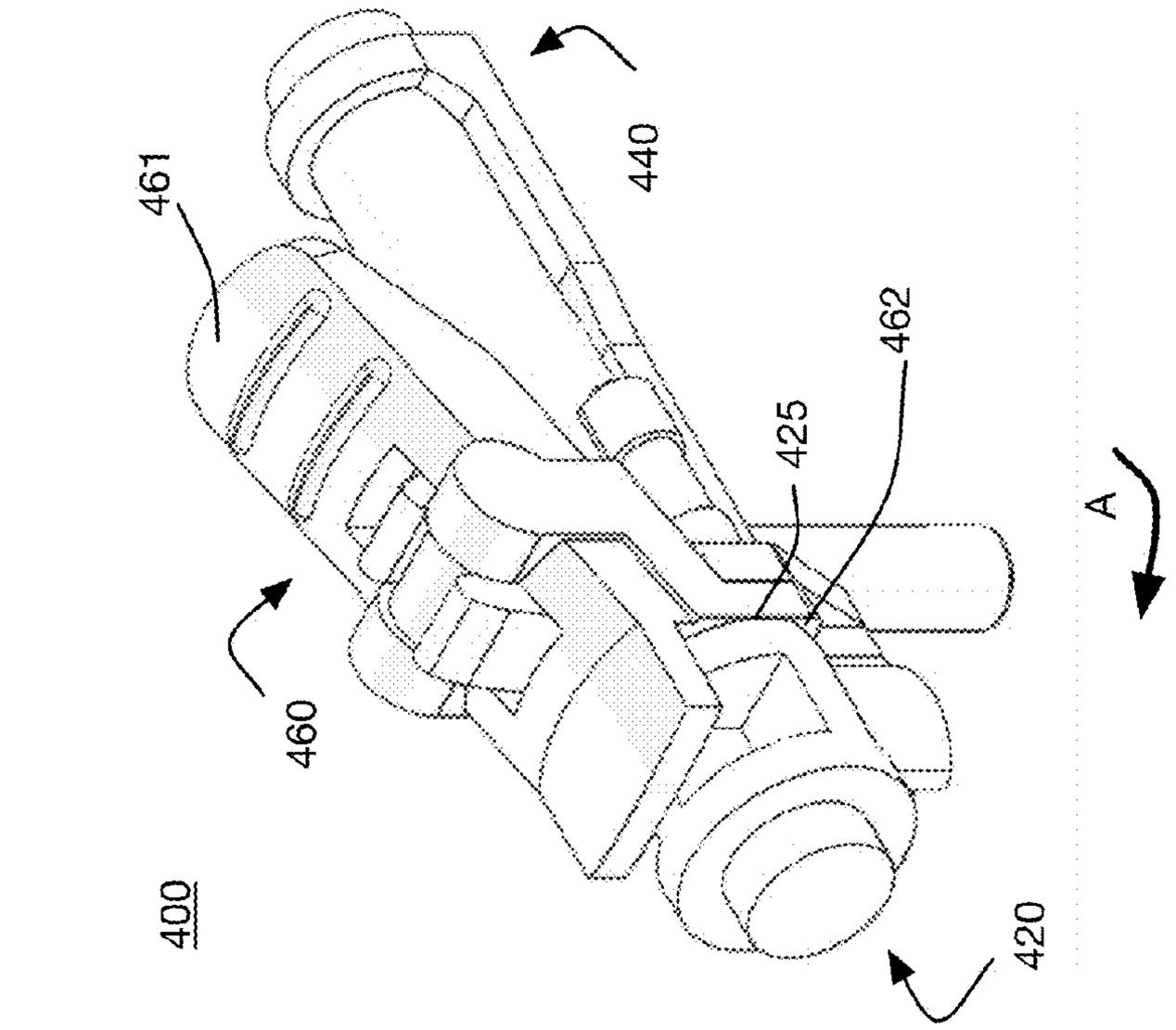
Z
X

FIG. 4B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440
462
425
460
420
400
A

FIG. 4A

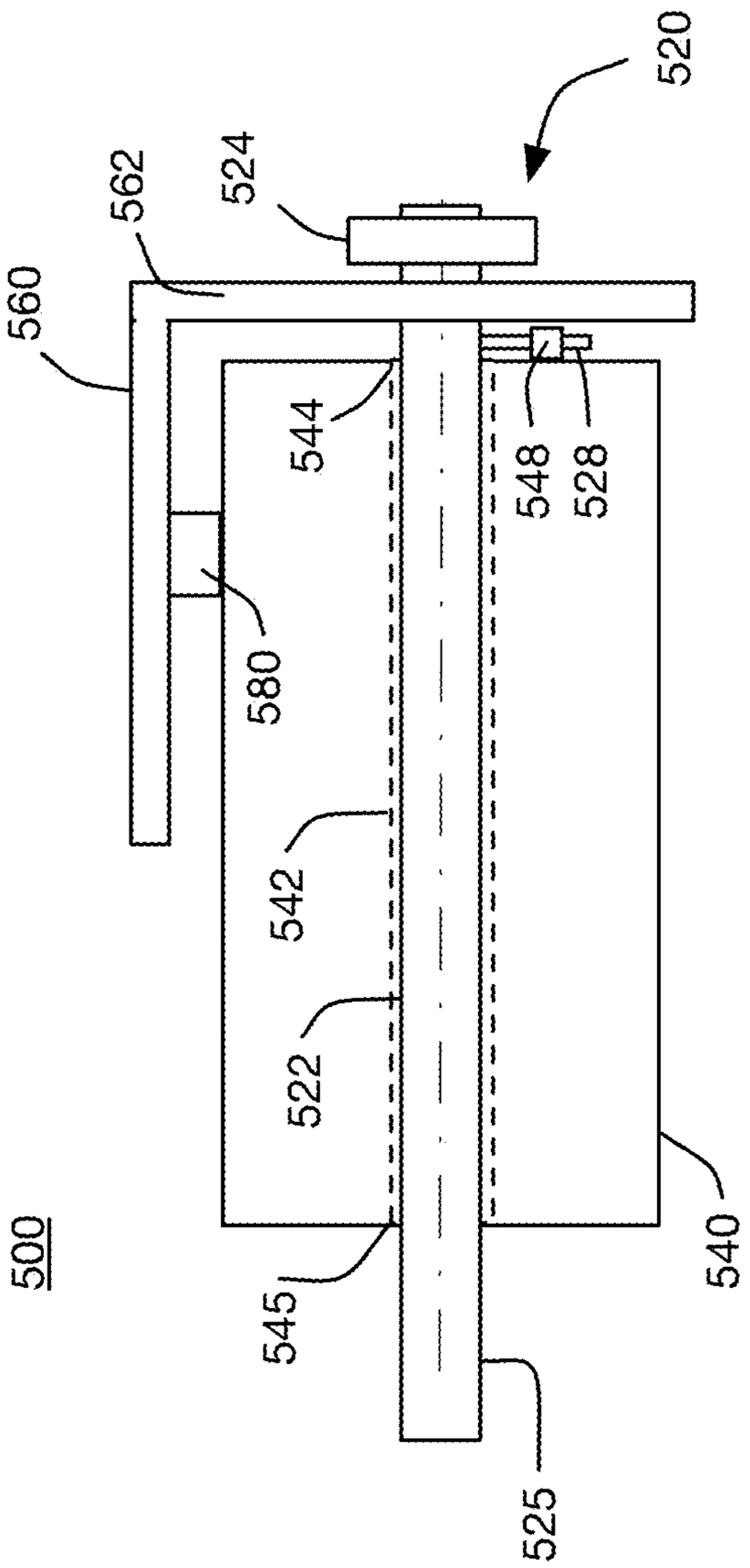
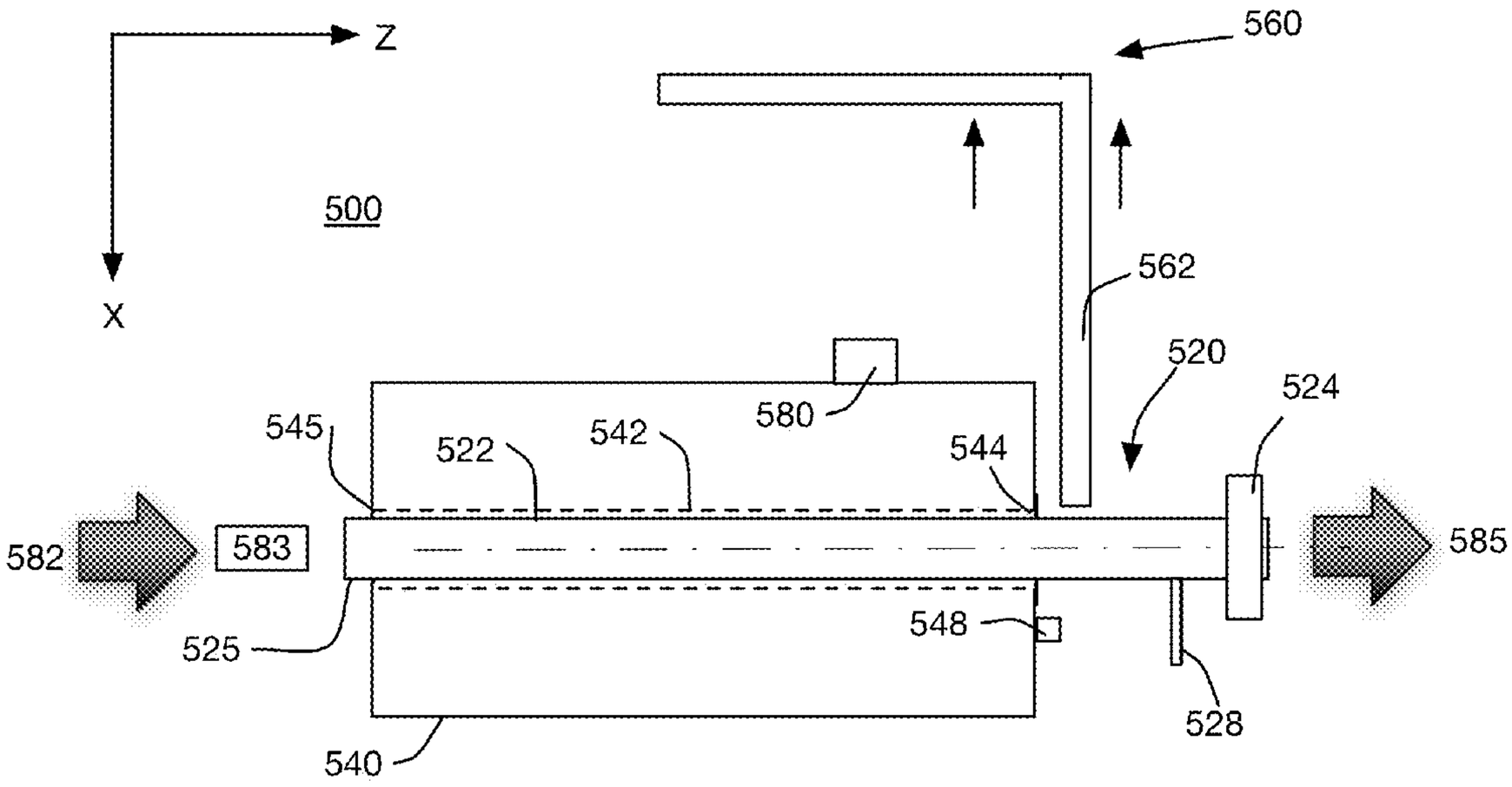


FIG. 5A


Z
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500
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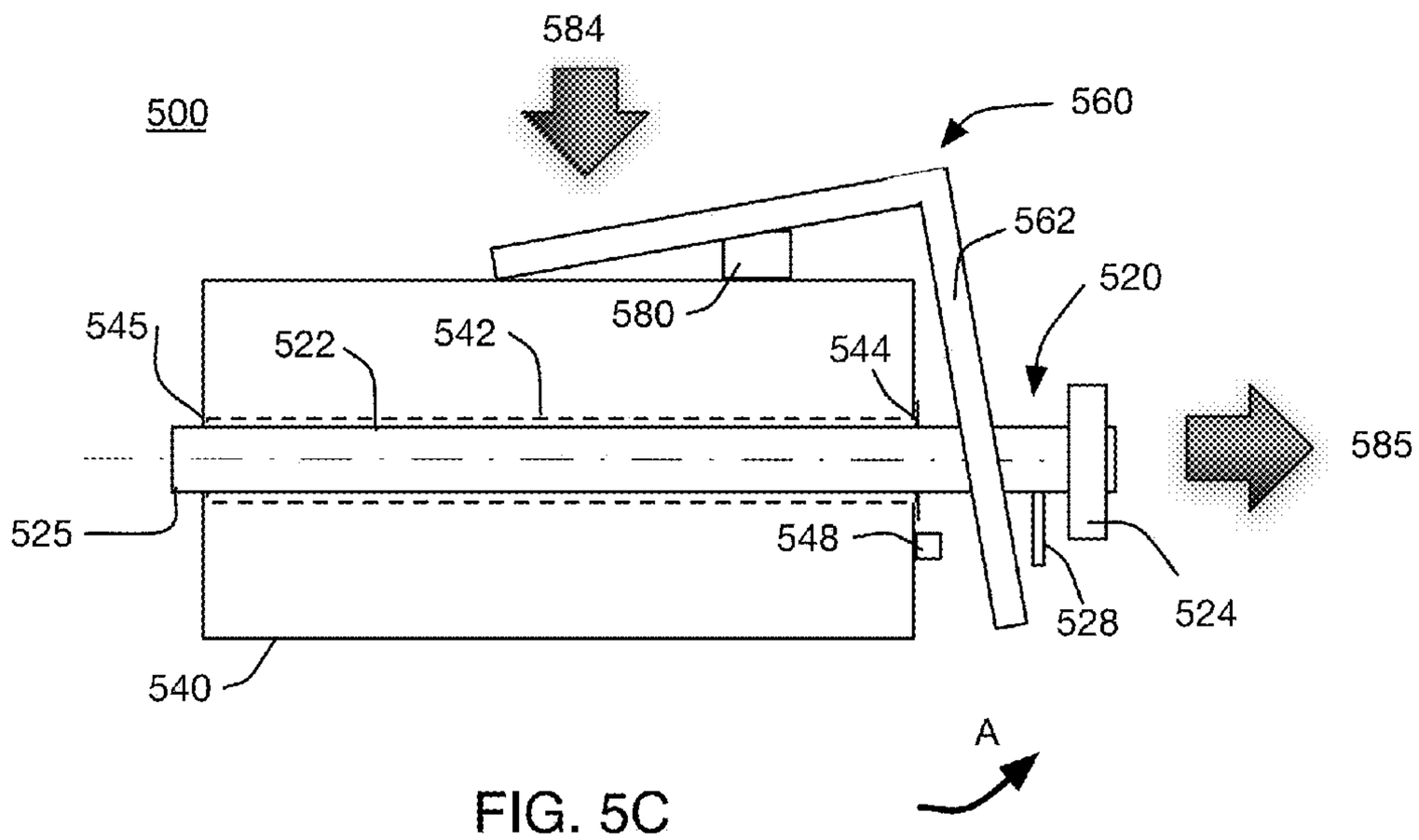
FIG. 5B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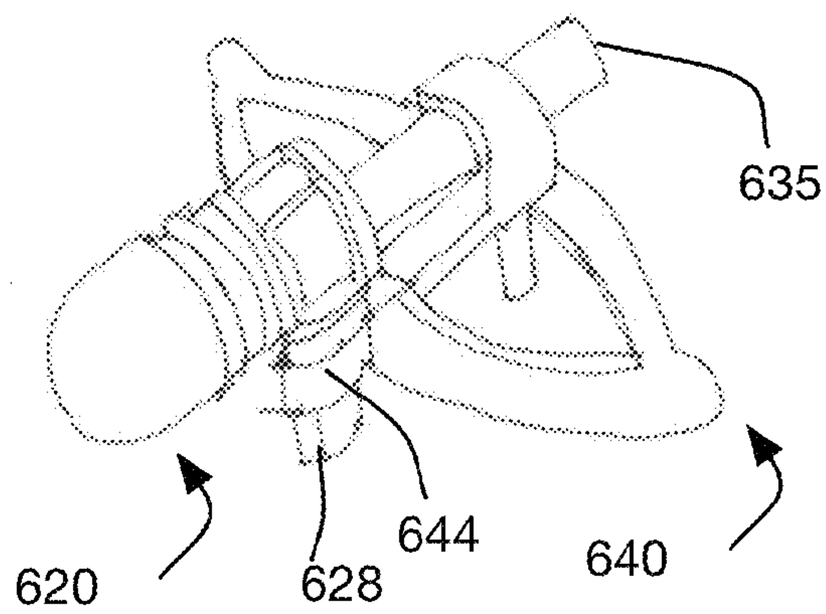
A

FIG. 5C

FIG. 6A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644
640

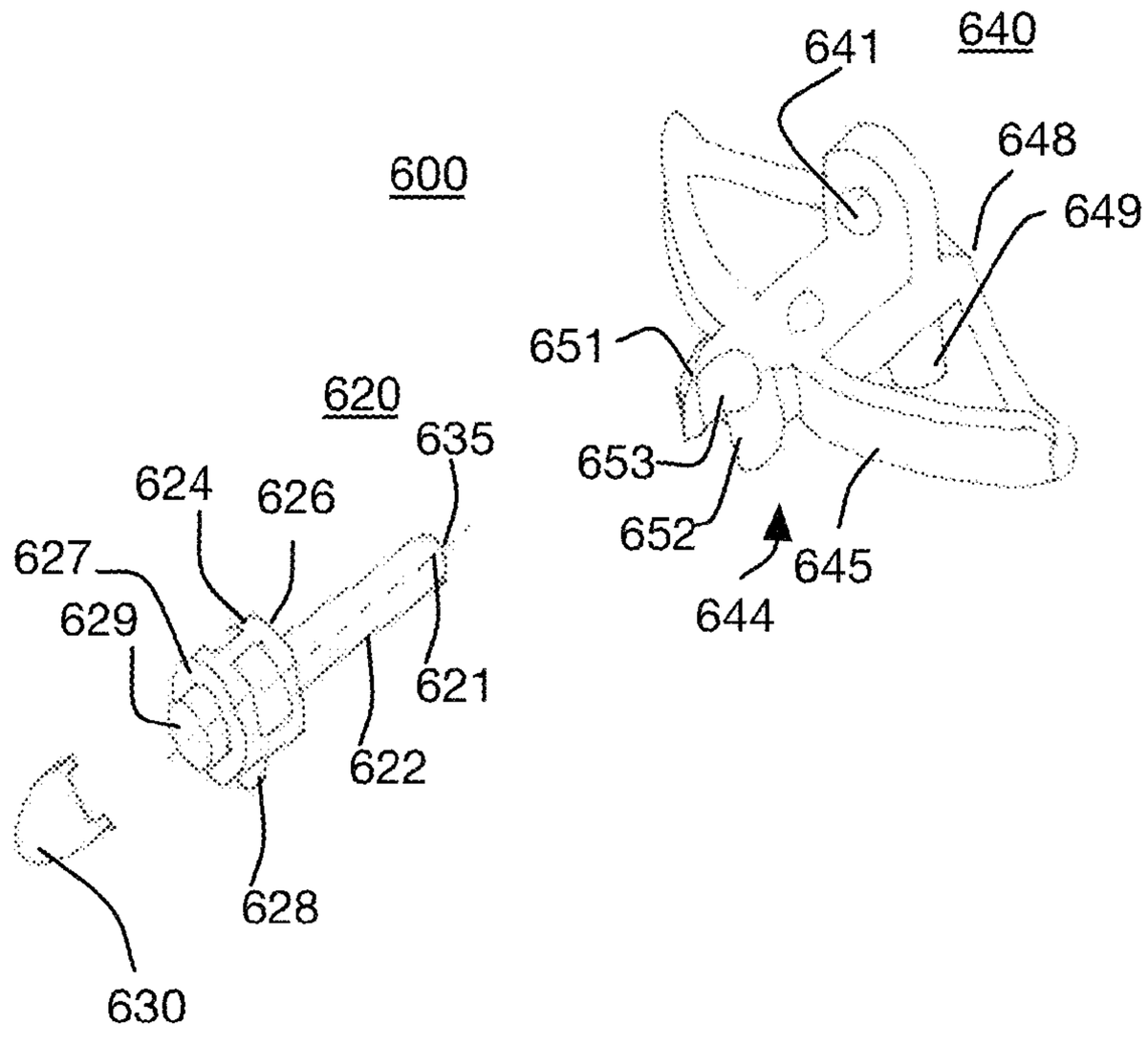
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FIG. 6B

PROJECTILE FIRING BUILDING ELEMENT

CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority to U.S. Provisional Application No. 61/707,432, filed on Sep. 28, 2012 and entitled PROJECTILE FIRING BUILDING ELEMENT, which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

This disclosure relates to a projectile firing building element.

BACKGROUND

Children enjoy playing and interacting with toys that move. Typically, movement or animation in toys can be produced using a set of gears and springs mechanically coupled to the toy.

Toy construction sets are made up of a plurality of building elements, which include coupling mechanisms such as studs or recesses of specific heights and placement to enable interconnection with other building elements.

SUMMARY

In one general aspect, a toy assembly includes a projectile that includes a linear portion and an engagement portion. The toy assembly also includes a base that includes a pivot point and defines an opening that receives the linear portion of the projectile, and the base retains the projectile in a frictional engagement. The assembly also includes an actuator that includes a trigger portion. The actuator is coupled to the base at the pivot point. Applying force to the trigger portion of the actuator in a first direction causes movement of the engagement portion of the projectile in a second direction, distinct from the first direction, and releases the projectile from the frictional engagement.

Implementations may include one or more of the following features. The first direction can be toward a surface that holds the pivot point, and the second direction can be parallel to a longitudinal axis of the linear portion of the projectile.

The actuator can include a wall portion configured to contact the engagement portion of the projectile, and applying force to the trigger portion of the actuator can cause the wall portion to push the engagement portion of the projectile in the second direction. The engagement portion of the projectile can include a flat face extending radially from a longitudinal axis of the linear portion.

The base can include a clamp, and the frictional engagement can include placing part of the projectile in the clamp. One or more of the clamp or the pivot point can include a c-clip. When the clamp is a c-clip, the projectile can further include a post that extends radially from the projectile, and the post is the part of the projectile that is placed in the c-clip.

The base can further include a coupling stud and a coupling recess for connecting the base to a separate building element. The base can include a first building element that is releasably coupled to a second building element and a third building element, where the second building element includes the clamp and the third building element includes the pivot point. The clamp can be at a first side of the base and the pivot point can be at a second side of the base, where the first side has a normal perpendicular to a normal of the second side. The clamp can protrude from the first side of the base, and the pivot point can protrude from the second side of the base.

The base can define a second opening through which an end of the linear portion of the projectile is accessible. The trigger portion of the actuator can include a coupling stud. The actuator can include a recess that accepts the protruding pivot point to couple the actuator to the base. The wall portion of the actuator can define a notch configured for placement around the linear portion of the projectile. The linear portion of the projectile can have a circular cross-section.

In another general aspect, a toy construction system includes a projectile including a linear portion having a first end and a second end, and an engagement portion at the first end. The system also includes a base including a clamp and a pivot point, the base defining a first opening that receives the second end of the linear portion of the projectile and a second opening that provides access to the second end of the linear portion, and the clamp retaining a portion of the projectile. The system also includes a first actuator removably coupled to the pivot point, the first actuator configured to cause release of the projectile from the clamp in a direction parallel to a longitudinal axis of the linear portion when force is applied to the first actuator in a direction that is different from the direction parallel to the longitudinal axis of the linear portion, and a second actuator configured to cause release of the projectile from the clamp when force is applied to the second end of the linear portion of the projectile.

Implementations can include one or more of the following features. The second actuator can include a building element that pushes the second end of the linear portion. The second end of the linear portion can pass through the second opening to an exterior of the base. The first actuator can include a wall portion and a trigger portion. The wall portion can be configured to contact the engagement portion of the projectile, and applying force to the first actuator can include applying force to the trigger portion in a direction that is towards a surface that holds the pivot point to cause the wall portion to move the engagement portion of the projectile in the direction parallel to the longitudinal axis of the linear portion of the projectile. The base can include a coupling stud and a coupling recess.

In another general aspect, a device includes a projectile including a linear portion that extends along a longitudinal axis, and a flat face and a post that extend radially from the longitudinal axis. The device also includes a base with a coupling stud, a coupling recess, a pivot point, and a clamp, where the base defines an opening in one side that receives the linear portion of the projectile, and the clamp retains the linear portion of the projectile in the base. The device also includes an actuator coupled to the base at the pivot point, the actuator includes a wall portion and a trigger portion, the wall portion being disposed between the flat face of the projectile and the side of the base that defines the opening.

In another general aspect, a toy construction system includes a plurality of interconnectible building elements, and a toy assembly configured to connect to at least one of the interconnectible building elements. The toy assembly includes a projectile that includes a linear portion and an engagement portion, and a base that includes a pivot point and defines an opening that receives the linear portion of the projectile, the base retaining the projectile in a frictional engagement. The toy assembly also includes an actuator including a trigger portion, the actuator coupled to the base at the pivot point. Applying force to the trigger portion of the actuator in a first direction causes movement of the engagement portion of the projectile in a second direction, distinct from the first direction, and releases the projectile from the frictional engagement.

In another general aspect, a toy assembly includes a projectile including a linear portion that extends along a longitudinal axis, the linear portion including a first end and a second end, and a post that extends radially outward from the longitudinal axis at the first end; and a base defining an opening that receives the linear portion, and the base including a clamp extending outward from a surface of the base, the clamp receiving the post that extends radially outward from the longitudinal axis, where the projectile is released from the base in response to a force applied directly to the second end of the linear portion.

Implementations can include one or more of the following features. The clamp can include a c-clip. The base further can include a post sized to fit into a c-clip of a building element that is separate and distinct from the projectile and the base. When the projectile is released from the base, the post can be released from the clamp.

The subject matter discussed above can be implemented as a toy assembly, a kit for a toy assembly, a toy construction system, a system that includes a toy assembly, a device, and/or a method or process for using a toy assembly. Further features and advantages will become more readily apparent from the following detailed description when taken in conjunction with the accompanying drawings.

DRAWING DESCRIPTION

The present disclosure is further described in the detailed description that follows, in reference to the noted drawings by way of non-limiting examples of exemplary implementations, in which like reference numerals represent similar parts throughout the several views of the drawings, and wherein:

FIG. **1**A is a side view of an exemplary toy assembly that includes a projectile held in a base.

FIG. **1**B is a side view of the exemplary toy assembly of FIG. **1**A with the projectile released.

FIG. **2**A is a perspective view of another exemplary toy assembly.

FIG. **2**B is an exploded perspective view of the toy assembly of FIG. **2**A.

FIG. **2**C is a top view of the toy assembly of FIG. **2**A.

FIG. **2**D is a front view of the toy assembly of FIG. **2**A.

FIG. **2**E is a side view of the toy assembly of FIG. **2**A.

FIG. **2**F is a rear view of the toy assembly of FIG. **2**A.

FIG. **3**A is a perspective view of another exemplary toy assembly.

FIG. **3**B is an exploded perspective view of a base assembly of the toy assembly shown in FIG. **3**A.

FIG. **3**C is a perspective view of the exemplary toy assembly shown in FIG. **3**A with the projectile released.

FIG. **4**A is a perspective view of another exemplary toy assembly.

FIG. **4**B is an exploded perspective view of the exemplary toy assembly of FIG. **4**A.

FIG. **5**A is a side view of another exemplary toy assembly.

FIG. **5**B is a side view of the toy assembly of FIG. **5**A releasing a projectile in a first manner.

FIG. **5**C is a side view of the toy assembly of FIG. **5**A releasing a projectile in a second manner.

FIG. **6**A is a perspective view of another exemplary toy assembly.

FIG. **6**B is an exploded perspective view of the toy assembly of FIG. **6**A.

DESCRIPTION

A toy assembly having a projectile, a base, and an actuator (or hinge) is disclosed. The base of the toy assembly holds the projectile. Applying force to the actuator causes the release (or firing) of the projectile, and the released projectile moves away from the base in a direction that is different from the direction of the applied force. In some implementations, the projectile can be released in multiple ways. In some implementations, the projectile can be released by applying force directly to one end of the projectile. The toy assembly can be used on its own or as part of a larger toy system that is assembled by connecting the toy assembly to one or more other components, such as interconnecting building elements.

Referring to FIG. **1**A, an exemplary toy assembly **100** includes a projectile **120**, a base **140** that receives the projectile **120** in an opening **142**, and an actuator **160**. The actuator **160** is coupled to the base **140** at a pivot point **180**. Referring also to FIG. **1**B, the toy assembly **100** fires the projectile **120** in response to a force **182** that is applied to the actuator **160** in a direction "X". Application of the force **182** to the actuator **160** causes the actuator **160** to rotate about the pivot point **180** such that a wall portion **162** of the actuator **160** tilts away from the base **140** along an arc "A." The tilting wall portion **162** contacts the projectile **120** at an interface **184**, thus pushing the projectile **120** in a direction "Z." Consequently, the projectile **120** is released from the base **140** and moves along the direction "Z."

Referring to FIG. **2**A, a perspective view of another exemplary toy assembly **200** is shown. The toy assembly **200** includes a projectile **220** that is received and held in a base **240**. The projectile **220** is released from the base **240** in response to application of a force on an actuator **260** that is coupled to the base **240** at a pivot point **280**. In greater detail, when force is applied to a trigger portion **270** of the actuator **260** in a direction "X," the actuator **260** rotates about the pivot point **280**, causing a wall portion **262** of the actuator **260** to tilt away from a surface **244** of the base **240**. The tilting wall portion **262** pushes on the projectile **220** to release the projectile **220** from the base **240**. Once released, the projectile **220** moves away from the base **240** along a direction "Z." As such, application of force to the toy assembly **200** in one direction causes the projectile **220** to be released from the base **240** and travel in a direction ("Z") that is different than the direction of the applied force ("X").

Referring also to FIG. **2**B, the projectile **220** includes a linear portion **222**, an engagement portion **224**, a coupling stud **226**, and a post **228**. The linear portion **222** extends along a longitudinal axis **223**, and the engagement portion **224** and the post **228** extend radially from the longitudinal axis **223**. The engagement portion **224** has a flat face **225** configured for contact with the actuator **260**. The coupling stud **226** allows the projectile to be connected to one or more building elements in a construction set **230**.

The base **240** includes a side **241** that defines a first end **243** of an opening **242** that receives the projectile **220**. The opening **242** extends into the base **240** and defines an axis **244**. The side **241** also includes a clamp **246**. The clamp **246** holds the post **228** of the projectile **220** to retain the projectile **220** in the base **240**. The clamp **246** includes a c-clip that extends outward from the base **240** in a direction that is normal to the surface of the side **241**. The base **240** also includes the pivot point **280**. The pivot point **280** includes a c-clip that extends outward from the base **240** along a direction that is normal to a surface **248**. In the toy assembly **200**, the clamp **246**, and the pivot point **280** are integral with the base **240** such that the base **240** is a single piece.

The base **240** can include one or more coupling mechanisms that allow interconnection with other building elements. For example, the base **240** includes a stud **250**, and the

bottom of the base **240** can include one or more recesses (not shown) sized and arranged to accept and hold one or more studs of other building elements of the construction set **230**.

The actuator **260** includes a wall portion **262** and a trigger portion **270**. The wall portion **262** defines a notch **268**. When the actuator **260** is coupled to the base **240** at the pivot point **280**, the notch **268** fits over and partially surrounds the linear portion **222** of the projectile **220**. The wall portion **262** also includes a flat surface **264** that engages with at least part of the face **225** of the projectile **220**.

The trigger portion **270** of the actuator **260** includes a surface **272** having a recess **274** and a bar **276**. The recess **274** and the bar **276** receive the pivot point **280** to couple the actuator **260** to the base **240**. The trigger portion **270** also includes a stud **278**. The stud **278** allows interconnection of the trigger portion **270** with other building elements of the construction set **230**. The stud **278** also can be the portion of the actuator **260** that receives the force for releasing the projectile **220**.

FIGS. **2**C-**2**F are, respectively, top, front, side, and rear views of the exemplary toy assembly **200**. Referring to FIG. **2**C, the bar **276** of the actuator **260** snaps into the c-clip of the pivot point **280** to couple the actuator **260** to the base **240**. Referring to FIG. **2**D, the c-clip of the clamp **246** holds the post **228** of the projectile **220**. As shown in FIG. **2**E, when the actuator **260** is coupled into the pivot point **280** and the projectile **220** is inserted in the base **240**, the wall portion **262** of the actuator **260** is disposed between the engagement portion **224** of the projectile **220** and the base **240**. Referring to FIG. **2**F, the linear portion **222** of the projectile **220** has a circular cross-section. The end **227** of the projectile **220** is accessible from an exterior of the base **240** through an opening **245** defined in a rear side of the base **240**.

Referring to FIG. **3**A, a perspective view of another exemplary toy assembly **300** is shown. The toy assembly **300** includes a projectile **320**, a base assembly **340**, and an actuator **360**. In the toy assembly **300**, instead of being a single piece, the base assembly **340** is formed from multiple interconnecting building elements.

FIG. **3**B is an exploded perspective view of the building elements of the base assembly **340**. The building elements for the base assembly **340** include two base blocks **341** and **342**, a clamp block **344**, and a pivot point **380**. The base blocks **341** and **342** define respective openings **347** and **348**. The clamp block **344** includes a c-clip **345**. The base blocks **341** and **342** also include respective studs **349** and **350**, and each of the base blocks **341** and **342** include recesses in a bottom side (not shown) that allow the base blocks **341** and **342** to interconnect with studs **351** and **352** of the clamp block **344**.

FIGS. **3**A and **3**C show the toy assembly **300** with the base assembly **340** in an assembled state. Referring again to FIG. **3**B, to assemble the base assembly **340**, studs **351** and **352** on the clamp block **344** are connected the bottom sides of the base blocks **341** and **342**. Connecting the base blocks **341** and **342** to the clamp block **344** results in the base blocks **341** and **342** being laterally displaced along the clamp block **344** with the centers of the openings **347** and **348** aligned. The aligned openings **347** and **348** define a passage **353** (FIG. **3**C) through the base assembly **340**.

As shown in FIGS. **3**A and **3**C, the pivot point **380** and the actuator **360** are connected to the base assembly **340**. To connect the pivot point **380** to the base assembly **340**, recesses (not shown) in the bottom of the pivot point **380** are connected to the stud **349** of the base block **341** such that a c-clip **382** of the pivot point **380** extends outward from the base block **341**. The actuator **360** is coupled to the c-clip **382** to connect the actuator **360** to the base assembly **340**.

The projectile **320** includes a linear portion **322**, an engagement portion **324**, and a post **328**. The actuator **360** includes a wall portion **362** and a trigger portion **370**. The wall portion **362** includes a surface **364** that contacts the engagement portion **324** of the projectile **320** when force is applied to the trigger portion **370**. The wall portion **362** also defines a notch **368**.

The projectile **320** is received in the base assembly **340** by inserting the linear portion **322** of the projectile **320** into the passage **353** until the post **328** snaps into the c-clip **345**. Once the post **328** snaps into the c-clip **345**, the wall portion **362** is disposed between the engagement portion **324** of the projectile **320** and the base block **341**. Additionally, the linear portion **322** extends through the passage **353** such that an end **325** of the projectile **320** accessible from an exterior of the base assembly **340**.

As shown in FIG. **3**C, when force is applied to the actuator **360**, the wall portion **362** tilts upward and away from the base block **341**. The tilting wall portion **362** pushes against the engagement portion **324** to release the post **328** from the c-clip **345**.

Referring to FIG. **4**A, another example of a toy assembly **400** is shown. The toy assembly **400** includes a projectile **420**, a base **440**, and an actuator **460**. The projectile **420** is held in the base **440**. Applying pressure to an end **461** of the actuator **460** in a direction "X" causes a wall portion **462** of the actuator **460** to tilt away from the base **440** along an arc "A". The tilting wall portion **462** presses against the projectile **420** and overcomes a frictional engagement that holds the projectile **420** in the base **440**. As a result, the projectile **420** is released from the base **440** along a direction "Z." Thus, the toy assembly **400** allows the projectile **420** to be fired in a direction different from the direction of the applied force.

Referring also to FIG. **4**B, the base **440** includes a body **449**, a clamp **444**, a base post **446**, a wall **448** that defines an opening **442**, and a pivot point **480**. The clamp **444** includes a c-clip that extends along a direction normal to a surface of the wall **448**, and the pivot point **480** includes a c-clip that extends outward from a surface of the body **449**. The size of the opening of the c-clip can be varied to control how far the projectile **420** is shot. The base **440** also includes the base post **446**, which can be used to couple the base **440** to, for example, another building element or a mount. For instance, the post **446** can be received in a c-clip that forms a hand of a toy action figure (not shown). The base post **446** can also be used as a grip for an operator who uses the toy assembly **400**, for example, when the toy assembly **400** is not connected to another building element.

The actuator **460** is connected to the base **440** by coupling a recess **464** and bar **466** of the actuator **460** to the pivot point **480**. When the actuator **460** is connected to the base, the wall portion **462** extends along the wall **448** such that a notch **468**, defined by the wall portion **462**, is placed over the opening **442**. Consequently, connection of the actuator **460** to the base **440** does not obstruct the opening **442**.

The projectile **420** is received in the base **440** through the opening **442**. The projectile **420** includes a linear portion **422**, an engagement portion **424**, a stud **426**, and a post **428**. The linear portion **422** extends along a longitudinal axis **423** and has a circular cross-section. When the linear portion **422** is received in the opening **442**, the post **428** of the projectile **420** snaps into the clamp **444** and holds the post **428** in frictional engagement. Additionally, when the projectile **420** is inserted into the opening **442**, the wall portion **462** is captured between the engagement portion **424** of the projectile **420** and the wall **448** of the base **440**. The positioning of the wall portion **462** relative to the engagement portion **424** allows the

actuator **460** to act as the firing mechanism for the projectile **420**. In the example shown, a force applied to the end **461** of the actuator **460** causes the wall portion **462** to tilt upward, away from the wall **443**, thus pushing the post **428** out of the clamp **444**.

Referring to FIGS. **5**A-**5**C, side views of an example of a toy construction system **500** are shown. The system **500** can fire a projectile **520** in two different ways. FIG. **5**A is a side view of the system **500** before the projectile **520** is fired. FIG. **5**B is a side view of the system **500** being fired in a first way, and FIG. **5**C is a side view of the toy system being fired in a second way. As shown in FIG. **5**B, applying a force **582** to an end **525** of the projectile **520** fires the projectile **520** in a direction **585**. As shown in FIG. **5**C, applying a force **584** to a first actuator **560** causes a wall portion **562** of the first actuator **560** to tilt and push the projectile **520** out of the system **500** in the direction **585**.

The system **500** includes a projectile **520**, a base **540**, and a first actuator **560**. The projectile **520** is received in a passage **542** that extends through the base **540** from a first opening **544** to a second opening **545**. The projectile **520** includes a linear portion **522**, an engagement portion **524**, an end **525**, and a post **528**. The projectile **520** is held in the base **540** through a frictional engagement between the post **528** and a clamp **548**, and the end **525** is accessible from an exterior of the base **540**.

Referring to FIG. **5**B, the projectile **520** is released from the base **540** when a force **582** sufficient to overcome the frictional engagement between the post **528** and the clamp **548** is applied to the end **525** in a direction "Z." To release the projectile **520**, an operator of the system **500** applies the force **582** to the end **525** through an element **583**. The element **583** can be referred to as a second actuator. The element **583** can be, for example, a tool that makes direct contact with the end **525**, another building element that is indirectly connected to the end **525**, or a portion of the operator, such as a part of the operator's hand, that makes direct physical contact with the end **525**.

In the example of FIG. **5**B, the first actuator **560** is removed from the base **540** before the force **582** is applied. The pivot point **580** can be a c-clip that receives and holds a portion of the first actuator **560**, but also allows the first actuator **560** to be removed from the base **540**. For example, the first actuator **560** can be removed from the pivot point **580** by pulling the first actuator **560** away from the pivot point **580** to release the first actuator **560** from the frictional engagement provided by the c-clip.

Although FIG. **5**B shows the projectile **520** being released with the first actuator **560** removed, the projectile **520** can be fired from the system **500** without removing the first actuator **560**. The first actuator **560** includes a wall portion **562** that defines a notch (not shown) that partially surrounds the linear portion **522** of the projectile **520** without obscuring the first opening **544**. Thus, the projectile **520** can be ejected from the base **540** without removing or moving the first actuator **560**.

Referring to FIG. **5**C, the projectile **520** is released from the base **540** in response to the application of the force **584** to the first actuator **560**. The force **584** is applied in a direction "X", causing the wall portion **562** to tilt away from a side **546** along an arc "A." The tiling wall portion **562** presses against the engagement portion **524** to overcome the frictional engagement between the post **528** and the clamp **548** and release the projectile **520** from the base **540**. Once released, the projectile **520** exits the base **540** in the direction "Z."

Referring to FIG. **6**A, a perspective view of another toy assembly **600** is shown. The toy assembly **600** includes a projectile **620** that is received in a base **640**. The projectile **620** is held in the base **640** by a clamp **644**. The projectile **620** is released from the base **640** in response to a force being directly applied to a second end **635** of the projectile **620**. Application of force to the second end **635** causes the projectile **620** to be entirely released from the base **640**. In other words, the projectile **620** and the second end **635**, which is the portion of the toy assembly **600** that is used to eject the projectile **620** from the base **640**, are a single element and both are disconnected from the base **640** in response to the application of force.

Referring also to FIG. **6**B, an exploded perspective view of the toy assembly **600** is shown. The projectile **620** defines a longitudinal axis **621**, and includes a linear portion **622** and a post **628**. The linear portion **622** extends along the longitudinal axis **621**, and the post **628** extends radially outward along a direction that is normal to the longitudinal axis **621**.

The projectile **620** also includes a collar **624** that defines flat faces **626** and **627**. The flat face **627** includes a stud **629** that connects to a cavity on a separate building element, a protective piece, or a decorative element. In the example of FIG. **6**B, the stud **629** connects to an end cap **630**.

The base **640** includes the clamp **644** that protrudes from a side **645** of the base **640**. The clamp **644** is a single-piece element that has a shape that changes only enough to open sufficiently to hold the post **628** in frictional engagement between prongs **651** and **652** that define an opening **653**. In particular, to insert the post **628** into the clamp **644**, the post **628** is pressed against the prongs **651** and **652** until the post **644** is received in the opening **653**. When the force is applied to the second end **635**, the prongs **651** and **652** are forced open as the post **628** moves outward from the base **640**. As the post **628** moves forward, the clamps **651** and **652** squeeze the post **628** as the clamps **651** and **652** return to their original shape. The squeezing pushes the post **628**, forcing the projectile **620** forward so that the projectile launches from the base **640**. In other words, the clamp **644** holds the projectile **620** in the base with the prongs **651** and **652**, and the prongs **651** and **652** also provides at least part of the mechanism and/or force that propels the projectile **620** away from the base.

The clamp **644** can be a c-clip, as shown in the example of FIG. **6**B. As compared to other connection mechanisms, the c-clip offers a compact design that can be sized to be the scale of the base **640** and makes a minimal visual and structural impact on the base **640**.

The clamp **644** receives the post **628** of the projectile, and frictional engagement between the post **628** and the clamp **644** holds the projectile **620** to the base. The base **640** also defines an opening **641** that receives the linear portion **622** of the projectile **620**. The second end **635** extends outwardly from a side **648** of the base **640** and is accessible from an exterior of the base **640**. The projectile **620** is released from the base **640** when the force applied to the second end **635** is sufficient to overcome the frictional engagement between the post **628** and the clamp **644**.

The base **640** also includes a post **649** that connects to a cavity or clip (such as a c-clip) on a separate element. For example, the post **649** can be received in a c-clip that forms a hand of an action figure toy (not shown).

Other implementations are within the scope of the following claims. For example, the projectiles **120**, **220**, **320**, **420**, and **520** can be held in their respective bases **140**, **240**, **240**, **440**, and **540** by a frictional engagement other than a c-clip that holds a portion of the projectile. For example, the projectiles **120**, **220**, **320**, **420**, and **520** can be held by an interference fit between the linear portion of the projectile and the opening defined by the base. In these implementations, the projectile can be held in the base without a post and a c-clip.

Any of the projectiles **120**, **220**, **320**, **420**, **520**, and **620** can be used with any of the bases **140**, **240**, **340**, **440**, **540**, or **640**.

Any of the bases **140**, **240**, **240**, **440**, **540** and **640** of the respective toy assemblies **100**, **200**, **300**, **400**, **600**, and the system **500** can be a molded, single-piece element or an assembly made from multiple interconnected components. The projectiles, bases, and/or actuators discussed above can be made of plastic.

The linear portions **122**, **222**, **322**, **422**, **522**, and **622** can have a cross-section of any shape. For example, the linear portions **122**, **222**, **322**, **422**, **522**, and **622** can have a cross-section in the shape of a circle, a square, a rectangle, a star, a hexagon, or an ellipse.

In implementations in which the clamp **246**, **345**, **444**, **548**, and/or **644** includes or is a c-clip, the size of the opening of the c-clip and/or the positioning of the prongs can be adjusted to control how far a projectile released from the c-clip travels.

While many alterations and modifications of the present disclosure will become apparent to a person of ordinary skill in the art after having read the foregoing description, it is to be understood that the particular embodiments shown and described by way of illustration are in no way intended to be considered limiting. Further, the disclosure has been described with reference to particular preferred embodiments, but variations within the spirit and scope of the disclosure will occur to those skilled in the art. The foregoing examples have been provided merely for the purpose of explanation and are in no way to be construed as limiting of the present disclosure. Although the present disclosure has been described with reference to exemplary implementations, the words, which have been used herein, are words of description and illustration, rather than words of limitation. Changes can be made, within the purview of the appended claims, as presently stated and as amended, without departing from the scope and spirit of the present disclosure in its aspects. Although the present disclosure has been described herein with reference to particular means, materials, and implementations, the present disclosure is not intended to be limited to the particulars disclosed herein; rather, the present disclosure extends to all functionally equivalent structures, methods and uses, such as are within the scope of the appended claims.

What is claimed is:

1. A toy assembly comprising:

a projectile comprising a linear portion and an engagement portion;

a base comprising a pivot point and defining an opening that receives the linear portion of the projectile, the base retaining the projectile in a frictional engagement; and

an actuator comprising a trigger portion, the actuator coupled to the base at the pivot point,

wherein applying force to the trigger portion of the actuator in a first direction causes movement of the engagement portion of the projectile in a second direction, distinct from the first direction, and releases the projectile from the frictional engagement.

2. The toy assembly of claim **1**, wherein the actuator comprises a wall portion configured to contact the engagement portion of the projectile, and applying force to the trigger portion of the actuator causes the wall portion to push the engagement portion of the projectile in the second direction.

3. The toy assembly of claim **2**, wherein the engagement portion of the projectile comprises a flat face extending radially from a longitudinal axis of the linear portion.

4. The toy assembly of claim **1**, wherein the base further comprises a clamp, and the frictional engagement comprises placing part of the projectile in the clamp.

5. The toy assembly of claim **4**, wherein one or more of the clamp or the pivot point comprises a c-clip.

6. The toy assembly of claim **5**, wherein the clamp comprises a c-clip, the projectile further comprises a post that extends radially from the projectile, and the post is the part of the projectile that is placed in the c-clip.

7. The toy assembly of claim **1**, wherein the base further comprises a coupling stud and a coupling recess for connecting the base to a separate building element.

8. The toy assembly of claim **4**, wherein the base comprises a first building element that is releasably coupled to a second building element and a third building element, the second building element comprising the clamp and the third building element comprising the pivot point.

9. The toy assembly of claim **4**, wherein the clamp is at a first side of the base and the pivot point is at a second side of the base, the first side having a normal perpendicular to a normal of the second side.

10. The toy assembly of claim **9**, wherein the clamp protrudes from the first side of the base, and the pivot point protrudes from the second side of the base.

11. The toy assembly of claim **1**, wherein the first direction is toward a surface that holds the pivot point, and the second direction is parallel to a longitudinal axis of the linear portion of the projectile.

12. The toy assembly of claim **1**, wherein the base defines a second opening through which an end of the linear portion of the projectile is accessible.

13. The toy assembly of claim **1**, wherein the trigger portion of the actuator comprises a coupling stud.

14. The toy assembly of claim **10**, wherein the actuator comprises a recess that accepts the protruding pivot point to couple the actuator to the base.

15. The toy assembly of claim **2**, wherein the wall portion of the actuator defines a notch configured for placement around the linear portion of the projectile.

16. The toy assembly of claim **1**, wherein the linear portion of the projectile has a circular cross-section.

17. A toy construction system comprising:

a projectile comprising a linear portion having a first end and a second end, and an engagement portion at the first end;

a base comprising a clamp and a pivot point, the base defining a first opening that receives the second end of the linear portion of the projectile and a second opening that provides access to the second end of the linear portion, and the clamp retaining a portion of the projectile;

a first actuator removably coupled to the pivot point, the first actuator configured to cause release of the projectile from the clamp in a direction parallel to a longitudinal axis of the linear portion when force is applied to the first actuator in a direction that is different from the direction parallel to the longitudinal axis of the linear portion; and

a second actuator configured to cause release of the projectile from the clamp when force is applied to the second end of the linear portion of the projectile.

18. The toy construction system of claim **17**, wherein the second actuator comprises a building element that pushes the second end of the linear portion.

19. The toy construction system of claim **17**, wherein the second end of the linear portion passes through the second opening to an exterior of the base.

20. The toy construction system of claim **17**, wherein:

the first actuator comprises a wall portion and a trigger portion, the wall portion being configured to contact the engagement portion of the projectile, and

applying force to the first actuator comprises applying force to the trigger portion in a direction that is towards a surface that holds the pivot point to cause the wall portion to move the engagement portion of the projectile in the direction parallel to the longitudinal axis of the linear portion of the projectile.

21. The toy construction system of claim **17**, wherein the base comprises a coupling stud and a coupling recess.

22. A device comprising:

a projectile comprising a linear portion that extends along a longitudinal axis, and a flat face and a post that extend radially from the longitudinal axis;

a base comprising a coupling stud, a coupling recess, a pivot point, and a clamp, the base defining an opening in one side that receives the linear portion of the projectile, and the clamp retaining the linear portion of the projectile in the base; and

an actuator coupled to the base at the pivot point, the actuator comprising a wall portion and a trigger portion, the wall portion being disposed between the flat face of the projectile and the side of the base that defines the opening,

wherein applying force to the trigger portion of the actuator in a first direction causes movement of the flat face of the projectile in a second direction, distinct from the first direction, and releases the projectile from a frictional engagement.

23. A toy construction system comprising:

a plurality of interconnectible building elements; and

a toy assembly configured to connect to at least one of the interconnectible building elements, the toy assembly comprising:

a projectile comprising a linear portion and an engagement portion;

a base comprising a pivot point and defining an opening that receives the linear portion of the projectile, the base retaining the projectile in a frictional engagement; and

an actuator comprising a trigger portion, the actuator coupled to the base at the pivot point,

wherein applying force to the trigger portion of the actuator in a first direction causes movement of the engagement portion of the projectile in a second direction, distinct from the first direction, and releases the projectile from the frictional engagement.

24. A toy assembly comprising:

a projectile comprising:

a linear portion that extends along a longitudinal axis, the linear portion comprising a first end and a second end, and

a post that extends radially outward from the longitudinal axis at the first end; and

a base defining an opening that receives the linear portion, and the base comprising a clamp extending outward from a surface of the base, the clamp receiving the post that extends radially outward from the longitudinal axis, wherein

the projectile is released from the base in response to a force applied directly to the second end of the linear portion.

25. The toy assembly of claim **24**, wherein the clamp comprises a c-clip.

26. The toy assembly of claim **25**, wherein the base further comprises a post sized to fit into a c-clip of a building element that is separate and distinct from the projectile and the base.

27. The toy assembly of claim **24**, wherein when the projectile is released from the base, the post is released from the clamp.

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